Introduction
Congenital hypogonadotrophic hypogonadism (CHH), a rare genetic disorder characterized by low gonadotropin and sex steroid levels, provides a model to study the impact of sex steroid deficiency on childhood growth. We characterized growth patterns in male CHH patients with special emphasis on genotype-phenotype correlation and growth during the minipuberty of infancy.

Design and participants
Growth charts of 36 Finnish and Danish males with CHH were evaluated; the most recent national growth reference data were used for comparisons (1,2). Fifteen patients (42%) had a genetically verified diagnosis of CHH (KAL1, FGFR1, GNRHR or PROK2). Patient characteristics are detailed in table 1.

Results
In CHH patients, the mean (±SD) length standard deviation score (SDS) at birth (0.2 [1.6] SDS) decreased significantly during the first 3 (to -0.9 [1.2] SDS, P<0.01) and 6 months of life (to -0.7 [1.3] SDS, P<0.05) (Fig. 1A). The respective mean length SDSs were lower than the mean mid-parental target height (MPH) SDS (P<0.05). We further tested the postnatal growth deflection by including only growth data of CHH patients with birth length within the normal range (±2 SD). Even within this subgroup (n=11), the average length SDS decreased significantly from birth (-0.3 [1.3] SDS) to 3 months (to -1.0 [1.3] SDS, P<0.01). During the first 6 mo of life, CHH patients grew thinner (mean change in weight-for-height, -6.7 [11] %, P<0.05). Between 2 and 3 years, the mean height SDS (-0.2 [1.3] SDS) did not differ from MPH SDS (P=NS). Thereafter, childhood growth remained constant. At an average age of 15.8 (0.8) years, height SDS reached its nadir (-1.8 [1.4] SDS), reflecting pubertal failure. Their final height (FH) SDS, however, did not differ from MPH SDSs (P=NS) (Fig.2). No clear genotype-growth associations emerged.

Conclusions
Moderate postnatal length deflection is a novel feature of CHH, and may reflect early androgen deficiency. Childhood growth patterns are not of clinical value in targeting molecular genetic studies of CHH.

Disclosure statement
The authors have nothing to disclose.

References